

## THE GENUS LITHURGUS (HYMENOPTERA: MEGACHILIDÆ)<sup>1</sup>

BY THEODORE B. MITCHELL

North Carolina State College

Although the genus *Lithurgus* is widely distributed over the earth, the number of species it includes is small, and in no part of the world is there any great number of them known to occur. In North America there are four distinct species, while from all Central and South America only about fourteen species have been described. Since the group is so limited, it is only rarely that new forms are discovered, and the few that are known have not as yet been keyed out in the literature. This paper is a brief summary of the genus in North America, together with a few records and descriptions from other regions.

The following key separates the known Nearctic species together with an apparently new species from an island off the west coast of Mexico

1. Females (only six abdominal terga visible, the sixth entirely hidden by extremely dense pubescence) .....2.  
     Males (seven abdominal terga visible, the apical terga visible through the relatively thin pubescence) .....7.
2. Facial protuberance much narrower than width of face .....3.  
     Facial protuberance almost as broad as face .....5.
3. Facial protuberance entire, protruding uniformly for its entire width, slightly bowed ..... *gibbosus* Smith  
     Facial protuberance not entire .....4.
4. Margin of prothorax dorsally conspicuously fasciate; scopa white ..... *echinocacti* Cockerell

<sup>1</sup>Research Contribution No. 2 published with the aid of the State College Research Fund, Department of Zoology, North Carolina State College of Agriculture and Engineering of the University of North Carolina.

- Margin of prothorax only very thinly fasciate; scopa yellowish-orange ..... *socorroensis* new species
5. Pubescence at tip of abdomen bright ferruginous .....  
..... *apicalis* Cresson
- Pubescence at tip of abdomen black .....6.
6. Apical margin of clypeus with a single median emargination; scopa without black hairs .....  
..... *apicalis* var. *opuntiae* Cockerell<sup>2</sup>
- Apical margin of clypeus with a small median emargination and a slightly deeper one on each side; scopa on sixth sternum black, with a few black hairs usually on the fifth also ..... *bruesi* Mitchell
7. Clypeus and supraclypeal area quite densely rugose or punctate .....8.
- At least the supraclypeal area shining and very sparsely punctate .....9.
8. Labrum with a prominent basal tubercle visible just above mandibles ..... *gibbosus* Smith
- Labrum not tuberculate ..... *echinocacti* Cockerell
9. Labrum with a pair of conspicuous parallel spines toward the base ..... *bruesi* Mitchell
- Labrum with a single median tubercle or none .....10.
10. Labrum with a basal median spine-like acute tubercle; supraclypeal area almost impunctate, the clypeus quite closely punctate ..... *socorroensis* new species
- Labrum not tuberculate; supraclypeal area with sparse scattered punctures, the clypeus also sparsely punctate medially .....11.

<sup>2</sup>*L. arizonensis* ♀ Cockerell has been described recently (Bull. So. Calif. Ac. Sc. 36, p. 108, 1938), but I was unaware of it at the time this manuscript was prepared. According to its description, it would run in this key to *opuntiae*, and is apparently very closely allied to it. Cockerell separates it from *opuntiae* ♀ by its more flattened clypeus, having larger punctures, and the facial punctures deeper and more widely separated. It seems probable that it is another variant of *apicalis*, but I am not warranted in forming any positive opinion until I have had the opportunity of examining it, and of examining a longer series of var. *opuntiae* than has hitherto been possible.

11. Pubescence at tip of abdomen rather dark ferruginous  
or fuscous ..... *apicalis* var. *opuntiae* Cockerell  
Pubescence at tip of abdomen light ferruginous .....  
..... *apicalis* Cresson

### **Lithurgus apicalis Cresson**

*Lithurgus apicalis* Cresson, Wheeler's Rep. Geogr. Expl. W. 100th Merid., p. 724, 1876. Cresson, Proc. Dav. Ac. 1, p. 209, 1876. Cockerell, Bull. Univ. N. Mex. 1, p. 64, 1898. Cockerell, Am. Nat. 34, p. 488, 1900. Cockerell, Ann. Mag. Nat. Hist. (7) 14, p. 24, 1904. Cockerell, Ann. Mag. Nat. Hist. (7) 17, p. 306, 1926. Cockerell, Am. Mus. Nov. 697, p. 13, 1934.

*Lithurgopsis apicalis* Fox, Ent. News 13, p. 139, 1902.

This species may be quickly recognized among the Nearctic species, by the conspicuous bright ferruginous pubescence at the tip of the abdomen.

ARIZONA: 1 ♂, no locality record. Recorded from Santa Rita Mts. (July) and Temez Mts.

CALIFORNIA: 1 ♀, Laguna, San Diego County, June 21, 1926 (W. S. Wright). 1 ♀, Mammoth, July 8 (or Aug. 7?), 1933.

COLORADO: 4 ♂, 3 ♀, no locality record. 1 ♂, Boulder, June 13, 1933 (M. T. James). 1 ♀, Buena Vista, July 6, 1937, (L. Lanham). 1 ♀, Las Animas, June 21, 1931. 1 ♂, Paonia, Delta County, June 14, 1926 (E. C. Van Dyke.) 1 ♀, Trinidad, June 13, 1899. 1 ♂, 1 ♀, White Rocks, Valmont, July 2 and 4, 1933 and May 30, 1934 (M. & H. James). Recorded also from Chimney Gulch, Fort Garland, Glenwood Springs, Mesa Verde, Ridgeway and Ute Creek.

NEVADA: 1 ♀, Mt. Charleston, 7500 ft., Aug. 13, 1931, (E. E. Tinkham).

NEW MEXICO: 2 ♀, Alamogordo, May 5 and June 9, 1902. 1 ♂, Highrolls, June 2, 1902. 1 ♂, E. Las Vegas, June 24, 1902. 5 ♂, 7 ♀, San Antonio, June 1921. 1 ♀, San Jose, Apr. 13, 1934, (M. & H. James). 1 ♂, Santa Fe, July 24, 1926 (E. C. Van Dyke).

TEXAS: 1 ♂, no locality record.

WYOMING: 1 ♀, Lake Bamforth, June 24, 1934 (R. O. & V. D. Christenson). Recorded also from Green River (July), Laramie River and Sheridan (Aug., on *Carduus*).

Specimens of *apicalis* have also been recorded from Kansas—Hamilton County; Nebraska—War Bonnet Canyon (June); and South Dakota—Custer.

***Lithurgus apicalis* var. *opuntiae* Cockerell**

*Lithurgus apicalis opuntiae* Cockerell, Ent. News 13, p. 182, 1902. Cockerell, Proc. U.S.N.M. 40, p. 251, 1911. Cockerell, Ann. Mag. Nat. Hist. (8) 13, p. 433, 1914.

There is no evident structural difference between this form and typical *apicalis*, the chief difference being one of color. It bears a close resemblance to *L. bruesi*, the females especially of the two being very similar. The presence of a single median emargination on the apical margin of the clypeus seems to be a constant character which will distinguish it from the female of *bruesi* in which there are three emarginations. The simple labrum of the male will easily distinguish it from *bruesi* in which that part is bispinose basally.

ARIZONA: 1 ♀, no locality record. 1 ♂, Kits Peak, Rincon, Baboquivari Mts., Aug. 1-4, 1916. 1 ♂, 1 ♀, S. Rita Mts., 5-7 and 12-6. Recorded also from Fort Grant.

CALIFORNIA: 1 ♂, Andrews Canyon, Apr. 5, 1925, (Timberlake, on *Opuntia*) [Timberlake].

COLORADO: 2 ♂, White Rocks, Valmont, May 30, 1934.

MEXICO: 1 ♂, 1 ♀, N. Sonora (Morrison) [Brit. Mus.].

TEXAS: Recorded from Valentine.

***Lithurgus apicalis* var. *littoralis* W. P. Cockerell**

*Lithurgus apicalis littoralis* W. P. Cockerell, Journ. N. Y. Ent. Soc. 25, p. 191, 1917.

I have had no opportunity to examine this form. It was briefly described from material collected at Point Isabel, near Brownsville, Texas. The size (10 mm.) and the presence of distinct black hair on the discs of the abdominal terga suggest that it is distinct from *apicalis*. I have one small male of *bruesi* which fits the description of *littoralis*



fairly well, but as no structural details are mentioned in the description it can only be suggested as possible that the two are the same.

### **Lithurgus bruesi** Mitchell

*Lithurgus bruesi* Mitchell, Psyche 34, No. 2, p. 104, 1927.  
Parks, Bull. Brooklyn Ent. Soc. 25, p. 265-7, 1930.

The female of this species was not known at the time that the male was described. Mr. H. B. Parks of San Antonio, Texas, has since collected it in numbers and the following description is based on that material.

*Female*: — Size: Length, 13-15 mm.; breadth of abdomen, 4.5-5 mm.; anterior wing, 10-11 mm.

*Structure*: Facial quadrangle about as broad as long; eyes subparallel; facial protuberance broad, evenly incurved, the lateral angles conspicuous; clypeus with shining impunctate apical margin which has a small median emargination and a slightly deeper emargination on each side of the middle; a shining malar space evident, this separated below from cheeks by a quite deep concavity; mandibles obtusely 3-dentate, with a triangular punctate basal area delimited by deep sutures; all the tibiae with prominent spine-like tubercles, largely confined to a single row on the front pair, but covering the posterior center surfaces of the others.

*Puncturation*: Punctures sparse and scattered on the relatively dull clypeus, close and rather fine at sides of face, on vertex back of ocelli, and most of cheeks, more coarse and scattered on cheeks below, more widely separated just above eyes; mesonotum and scutellum rather finely rugoso-punctate, the pleura finely and closely punctate above, becoming more coarse and sparse below, the propodeum tessellate, but hardly punctate, the tegulae impunctate and dull; abdomen impunctate basally, becoming distinctly punctate laterally and apically, the punctures of segment 5 quite deep and conspicuous, quite widely separated medially but close laterally.

*Color*: Black; antennae and tegulae very slightly reddened; wings faintly smoky, the nervures piceous to blackish; spurs brownish-yellow.

*Pubescence:* Thin and greyish but rather long on vertex, whiter and more dense around antennæ, at sides of face, and on cheeks behind and below, clypeus with an apical fringe which is white laterally but brownish medially; dorsum of thorax almost bare, pubescence laterally and beneath rather long, thin and greyish-white, whitish on legs basally, becoming more brownish apically, blackish on hind tarsi; abdomen basally largely bare above, with very short dark pubescence evident laterally, segment 5 with relatively long conspicuous fuscous pubescence, that on segment 6 fuscous and extremely dense; segments 2-5 with white apical fasciæ, interrupted medially on segments 2-4; scopa yellowish, fuscous to black on segment 6 and with some of the same color on segment 5 across apical margin; sterna 2-5 with entire white apical fasciæ beneath scopa.

9 ♂, 44 ♀, Bexar County (San Antonio), Texas. 1 ♂, Austin, Texas, Apr. 16, 1933 (both H. B. Parks). 1 ♀, Big Bend Park, Brewster Co., Texas, June 17, 1937, (R. H. Baker).

#### *Lithurgus echinocacti* Cockerell

*Lithurgus echinocacti* Cockerell, Ann. Mag. Nat. Hist. (7) 2, p. 453, 1898. Cockerell, Am. Nat. 34, p. 487, 1900. Cockerell, Ann. Mag. Nat. Hist. (9) 8, p. 368, 1921.

*Lithurgopsis echinocacti* Fox, Ent. News 13, p. 139, 1902.

This species bears some resemblance to *socorroensis* but differs from it in the following characters:

♀ — Prothorax with a distinct and conspicuous white fascia along its posterior margin; polished concavity of facial protuberance with scattered punctures; transverse process of labrum broader and less deeply emarginate.

♂ — Prothorax fasciate as in ♀; supraclypeal area more closely and coarsely punctate; labrum without a basal tubercle.

ARIZONA: 1 ♂, Coyote Mts., Aug. 3-7, 1916, about 3500 ft. [Am. Mus. Nat. Hist.]. Recorded from Palmerlee and Tempe (July and Aug.).

#### *Lithurgus gibbosus* Smith

*Lithurgus gibbosus* Smith, Cat. Hym. Brit. Mus. 1, p. 147, 1853. Cockerell, Am. Nat. 34, p. 487, 1900. Cockerell,

Entomologist 33, p. 244, 1900. Cockerell, Ann. Mag. Nat. Hist. (8) 13, p. 433, 1914.

*Lithurgus compressus* Smith, Cat. Hym. Brit. Mus. 1, p. 147, 1853.

*Lithurgopsis gibbosus* Fox, Ent. News 13, p. 140, 1902.

This species is the single representative of the genus occurring east of the Mississippi River.

FLORIDA: 1 ♀, Capron, Apr. 18. 2 ♂, Enterprise, Apr. 18, 1902 (Dr. Castle) and Apr. 24, 1903. 2 ♂, 1 ♀, Flamingo, Apr. 13, 1923.

GEORGIA: 1 ♀, St. Simons, June 2, 1922 (Mitchell, on *Opuntia*).

NORTH CAROLINA: 2 ♀, Carolina Beach, June 12, 1930. 1 ♂, Raleigh, June 7, 1922 (on *Opuntia*). 1 ♀, Tarheel, July 22, 1928 (on *Helianthus*). 4 ♀, White Lake, May 20, 1934 (on *Opuntia*); (all Mitchell).

TEXAS: 2 ♂, no locality record, 12 ♂, 20 ♀, Bexar County (San Antonio), May 12 to June 1, 1930 (H. B. Parks). 1 ♂, Fedor, May 1, 1897. Recorded also from Austin and Lee County.

### *Lithurgus socorroensis* new species

*Female*. — Size: Length 11 mm.; breadth of abdomen 3.7 mm.; anterior wing 7.5 mm.

*Structure*: Facial quadrangle slightly narrower above than long; eyes convergent below; clypeal margin straight and entire; labrum with a basal transverse process which is abruptly emarginate medially; facial protuberance low, concave, highly polished, somewhat conical on each side; lateral ocelli subequally distant from eyes and edge of vertex; vertex rounded; cheeks subequal in width to eyes; basal joint of flagellum equal to pedicel, the second joint broader but slightly shorter; mandibles 3-dentate, the middle tooth prominent; all the metatarsi slender, the hind pair equalling their tibiae in length, the others shorter than their respective tibiae; pulvilli inevident; outer posterior faces of all the tibiae conspicuously tuberculate, the tubercles short and acute, those on the front tibia more robust apically, forming a quite distinct posterior comb apically, those on the middle

tibia in two distinct rows, the surface between polished, those on the hind tibia scattered, the surface polished between them; apical margins of abdominal segments slightly depressed, more so toward sides.

*Puncturation*: Close and fine on face, vertex and on pleura above; coarse and rather sparse on pleura below and on the shining clypeus; cheeks finely and quite closely punctate above, rather coarsely so below; mesonotum rather coarsely striately rugose, especially medially, becoming finely rugose or subpunctate toward prothorax; scutellum rather finely rugose; basal segments of abdomen impunctate medially, becoming rather finely and closely punctate laterally, and the more apical segments quite distinctly punctate, the fifth with moderately coarse and distinctly separated punctures.

*Color*: Black; tegulæ and wing nervures piceous; antennæ beyond the basal joint of the flagellum ferruginous; wings subhyaline, faintly clouded apically; spurs yellow.

*Pubescence*: White at sides of face, around antennæ, on cheeks, pleura, propodeum, dorsum of thorax anteriorly, and on legs; white, but thin and inconspicuous on vertex; mesonotum, scutellum and basal abdominal terga almost bare, fifth tergum with scattered erect dark hairs, the apical one with dense fuscous pubescence; second to fifth terga with entire and conspicuous white apical fasciæ; sterna also with narrower but entire white apical fasciæ beneath the reddish or orange scopa.

*Male*. — Size: Length 10 mm.; breadth of abdomen 3 mm.; anterior wing 7 mm.

*Structure*: Face with breadth above about equal to length; eyes convergent below; lateral ocelli slightly nearer edge of vertex than to eyes; cheeks subequal in width to eyes; clypeal margin nearly straight, entire; labrum with a basal median conical robust tubercle; supraclypeal area flattened, impunctate medially, polished; basal joint of flagellum subequal to pedicel and to the second joint; mandibles 3-dentate; tibiæ finely tuberculate or rugose on outer faces, the metatarsi slender, shorter than their tibiæ; claws deeply cleft, a small but distinct pulvillus between them; apical margins of abdominal terga slightly depressed, especially toward sides.



*Puncturation:* Close and fine on vertex and pleura, becoming coarser but close on face and on clypeus; fine and close, but shallow and obscure on cheeks; mesonotum and scutellum finely rugose; punctures minute and rather sparse on fifth tergum, close and more coarse on sixth.

*Color:* Black; tegulae and wing nervures reddish-piceous; flagellum ferruginous; wings subhyaline, faintly clouded apically; spurs pale yellow.

*Pubescence:* White on face, cheeks, pleura, propodeum, legs and basal segment of abdomen; intermixed light and dark on vertex, mesonotum and scutellum; very short and blackish on the second and following segments of abdomen, becoming rather long on the more apical segments, especially on the sixth and seventh, the second to the sixth terga with entire white apical fasciae, the corresponding sterna with very narrow apical fasciae, the discs covered with long thin yellowish scopa-like hairs.

Type. — Female; Braithwaite Bay, Socorro Island, Revilagigedo Group (Mexico), May 7, 1925, (H. H. Keifer) [Calif. Ac. Sc. no. 4602].

Allotype. — Male; topotypical.

Paratypes. — 1 ♀, 21 ♂, topotypical.

### *Lithurgus corumbæ* Cockerell

*Lithurgus corumbæ* Cockerell, Proc. Ac. Sc. Phil. 53, p. 216, 1901.

The specimen described below bears the same data as the female described by Cockerell under this name and agrees with his description as to size and quite well also as to pattern of pubescence, allowing for sexual differences. There seems little doubt therefore that this specimen represents the other sex of the species.

*Male.* — Size: Length 7 mm.; breadth of abdomen 2 mm.; anterior wing 5 mm.

*Structure:* Face narrow, eyes slightly converging below, clypeus flat, the apical margin straight, labrum simple, without spines or tubercles, mandibles short, of the usual 3-dentate type, supraclypeal area with a pair of obscure low tubercles, one below each antenna, lateral ocelli slightly

nearer edge of vertex than to eyes, cheeks narrower than eyes, all the tarsi very slender, hind femora short and rather robust, about equalling the combined coxa and trochanter in length, pulvillae absent on all the legs, the claws deeply cleft, seventh tergum forming a nearly equilateral triangle, the apex sharply pointed.

*Puncturation*: Fine and densely crowded over face, clypeus, and median portion of vertex, more distinctly separated on vertex laterally, very fine and close, but not crowded, on cheeks; deep, close and distinct over most of thorax, but with evident shining spaces between, moderately coarse, becoming quite fine and crowded on sternum; very minute and crowded on median abdominal terga, becoming yet more fine and obscure toward the base, but quite coarse and distinct toward the apex.

*Color*: Black; mandibular teeth reddened; apical tarsal joints pale ferruginous; spurs pale yellow; tegulae ferruginous; wings subhyaline, the nervures fuscous.

*Pubescence*: White on head and thorax, but vertex and mesonotum with some very short and inconspicuous reddish pubescence, hind margin of prothorax above with a narrow but distinct white fascia and tubercles fringed with white; second to fourth abdominal terga with white apical fasciae broadly interrupted medially, the fifth and sixth terga with entire white fasciae, pubescence of the discs black, sterna with longer thin, white pubescence, black on the sixth and on the fifth laterally, no ventral fasciae evident.

1 ♂, Corumba, Brazil, April. (H. H. Smith) [A. N. S. P.]

#### *Lithurgus albofimbriatus* Sichel

6 ♀, Nukahiva, Marquessas Islands, Aug. 1923 (Simeon Delmar).

#### *Lithurgus rubricatus* Smith

1 ♀, Bilode, Queensland, Australia, 9. V. 25 (F. G. Holli-day). [Univ. Minn.]. 1 ♂, Queensland (Smith coll. pres. by Mrs. Farren White, 99-303) [Brit. Mus.].